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10/827,207	04/16/2004	Allen Olson	110630-002UTL	2334

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EXAMINER
SAUNDERS, PAUL

ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/827,207	OLSON ET AL.	
	Examiner	Art Unit	
	PAUL SAUNDERS	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-18* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The amendment filed 4/24/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Claim 18, specifically "at least four focus points".

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

2. The Examiner thanks the Applicant for the thorough and timely response filed 4/24/2008. Applicant's arguments with respect to claims 1-13 have been very helpful and have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claim 1 is** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Soenksen (WO 2001/084209 A2) in view of

ii. Montagu (US 6,262,838 B1).

Regarding **claim 1**, Soenksen discloses a computer implemented method (fig. 1, 4, page 25 lines 1-9) for determining the optimal focal height (page 30 lines 14-20, page

40 lines 1-6) for an objective lens 16 coupled with a line scan camera 18 in a virtual microscopy system (page 25 lines 20-22) prior to scanning (page 40 lines 17-18) a microscope slide (page 39 lines 12-13).

Soenksen does not expressly disclose comprising: identifying a plurality of focus points on a microscope slide (col. 10 lines 5-6); positioning an objective lens coupled with a line scan camera over a first focus point; scanning an image of the first focus point at a plurality of objective lens heights (col. 10 lines 1-4); determining the objective lens height having the greatest contrast in the scanned image (col. 10 lines 16-17); combining a plurality of objective lens heights into a non-planar focal surface, wherein an objective lens height at other than the plurality focus points is estimated (col. 10 lines 17-19 – topology of Best Focus being a focal surface that may non-planar); and adjusting the height of the objective lens according to the non-planar focal surface during subsequent scanning of the microscope slide (col. 10 lines 19-23).

Montagu discloses a computer implemented (col. 2 lines 25-32) microscope dynamic focusing method comprising: identifying a plurality of focus points on a microscope slide (col. 10 lines 5-6); positioning an objective lens coupled with a line scan camera over a first focus point; scanning an image of the first focus point at a plurality of objective lens heights (col. 10 lines 1-4); determining the objective lens height having the greatest contrast in the scanned image (col. 10 lines 16-17); combining a plurality of objective lens heights into a non-planar focal surface, wherein an objective lens height at other than the plurality focus points is estimated (col. 9 line 59, col. 10 lines 17-19 – varying dimension being non-planer as an array of locations for

best focus is necessitated; topology of Best Focus being a non-planar focal surface); and adjusting the height of the objective lens according to the non-planar focal surface during subsequent scanning of the microscope slide (col. 10 lines 19-23). Therefore at the time of the invention it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the computer implementation taught by Soenksen to further employ a pre-scan to enable dynamic focusing during a scan as taught by Montagu in order to provide higher resolution for objects of varying dimension (col. 9 lines 59-61).

5. **Claims 2-6** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Soenksen (WO 2001/084209 A2) in view of

ii. Montagu (US 6,262,838 B1)

as applied to claim 1 above, and further in view of

iii. Raz (CA 2,229,175 A1).

Regarding **claim 2**, Soenksen as viewed does not expressly disclose the method of claim 1, wherein combining a plurality of objective lens heights into a non-planar focal surface comprises: connecting an objective lens height with a pair of neighboring objective lens heights to define a triangular region; and combining a plurality of objective triangular regions into the non-planar focal surface.

Raz discloses a controller (fig. 1) for a microscope focus mapping method wherein combining a plurality of objective lens heights into a non-planar focal surface comprises: connecting an objective lens height with a pair of neighboring objective lens

heights to define a triangular region; and combining a plurality of objective triangular regions into the non-planar focal surface (page 6 lines 1-12, fig. 10(d) – multiple neighboring focal positions being a triangular region, those skilled in the art would recognize that a focal position may be used more then once to define multiple triangular regions). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate triangular regions as taught by Raz in order to determine a focal position for a position not being a previously measured focal position (page 6 lines 10-12).

Regarding **claim 3**, Soenksen discloses the method of claim 2, wherein the non-planar focal surface covers the entire microscope slide 12 (page 13 line 14+).

Regarding **claim 4**, Soenksen discloses the method of claim 2, wherein the non-planar focal surface covers a sub-region of the microscope slide (sub region being substantially the microscope slide).

Regarding **claim 5**, Soenksen discloses the method of claim 4, wherein the sub-region substantially corresponds to the area of microscope slide comprising a specimen (page 13 - microscope slide may contain specimens).

Regarding **claim 6**, Soenksen discloses the method of claim 4, wherein the sub-region substantially corresponds to an image stripe (an image stripe being the whole image).

6. **Claims 7-15** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Soenksen (WO 2001/084209 A2) in view of

ii. Montagu (US 6,262,838 B1)

iii. Cottingham (US 4,806,015).

Regarding **claim 7**, Soenksen discloses a computer implemented method (fig. 1, 4, page 25 line 1-9) for determining the optimal focal height (page 30 lines 14-20, page 40 lines 1-6) for a plurality of objective lens locations in a virtual microscopy system prior to scanning (page 40 lines 17-18) a microscope slide (page 39 line 12-13), the virtual microscopy system (page 25 line 20-22) having an objective lens 18 coupled to a line scan camera 16 and a stage 14 for supporting a microscope slide 12 (fig. 1), the method comprising: moving the stage in a direction orthogonal to the objective lens (page 53 lines 4-10, 21-22).

Soenksen does not expressly disclose determining the optimal focal height for a plurality of objective lens locations and the method comprising continuously adjusting the height of the objective lens relative to the stage while the stage is in motion; scanning an image of an area on the microscope slide while the stage is in motion and the height of the objective lens is continuously adjusted; determining a plurality of objective lens locations having the greatest contrast in the scanned image.

Montagu discloses a computer implemented (col. 2 lines 25-32) microscope dynamic focusing method comprising determining the optimal focal height for a plurality of objective lens locations (col. 10 lines 5-6) and the method comprising; determining a plurality of objective lens locations having the greatest contrast in the scanned image (col. 10 lines 16-17). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the method taught by Soenksen to further employ a pre-scan of a plurality of points to enable dynamic focusing during a scan as taught by Montagu in order to provide higher resolution for objects of varying dimension (col. 9 lines 59-61).

Cottingham discloses a test slide moving focus pre-scan method, the method comprising continuously adjusting the height of the objective lens relative to the stage while the stage is in motion; scanning an image of an area on the microscope slide while the stage is in motion and the height of the objective lens is continuously adjusted (fig. 4, 5, col. 3 line 63-65). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the dynamic focusing method taught by Soenksen in view of Montagu to continuously adjust the focus while the stage is in motion for a plurality of focus points as taught by Cottingham because it is functionally equivalent.

Regarding **claim 8**, Soenksen discloses the method of claim 7, wherein an objective lens location comprises a planar location on the microscope slide and a height of the objective lens (fig. 1).

Regarding **claim 9**, Montagu discloses the method of claim 8, further comprising: combining a plurality of objective lens locations into a non-planar focal surface, wherein an objective lens height on the focal surface at other than the plurality of objective lens locations is estimated (col. 9 line 59, col. 10 lines 17-19 – varying dimension being non-planer as an array of locations for best focus is necessitated; topology of Best Focus being a non-planar focal surface); and adjusting the height of the objective lens according to the non-planar focal surface during subsequent scanning of the microscope slide (col. 10 lines 19-23).

Regarding **claim 10**, Soenksen discloses (refer to the rejection of claim 3) the method of claim 9, wherein the non-planar focal surface covers the entire microscope slide.

Regarding **claim 11**, Soenksen discloses (refer to the rejection of claim 4) the method of claim 9, wherein the non-planar focal surface covers a sub-region of the microscope slide.

Regarding **claim 12**, Soenksen discloses (refer to the rejection of claim 5) the method of claim 11, wherein the sub-region substantially corresponds to the area of microscope slide comprising a specimen.

Regarding **claim 13**, Soenksen discloses (refer to the rejection of claim 6) the method of claim 11, wherein the sub-region substantially corresponds to an image stripe.

Regarding **claim 14**, Soenksen as further viewed (refer to the rejection of claim 7, similar reasoning applies to this claim) discloses a computer implemented method for creating a digital image of a specimen on a microscope slide, comprising: determining a scan area comprising a region of the microscope slide that includes at least a portion of the specimen; dividing the scan area into a plurality of linear strips that each comprise opposing edges of the scan area (Soenksen page 54 – further it is well known that to divide an area into linear strips will include opposing edges of the area); determining a plurality of first focus points on a first linear strip (Soenksen page 54 lines 24-25), wherein a focal point comprises a planar location on the microscope slide and an objective lens height; creating a first focal surface for the first linear strip comprising each of the plurality of first focus points, wherein the objective lens height at points in the first focal surface other than said plurality of first focus points is estimated and the first focal surface is non-planar; scanning an image of the first linear strip (Cottingham col. 4 lines 1-2 – teaches pre-scan then scan of same strip, thus creating a focal map for each strip), wherein the height of the objective lens relative to the microscope slide follows the predetermined first focal surface; determining a plurality of second focus points on a second linear strip (Soenksen page 54 lines 25-26); creating a second focal surface for the second linear strip comprising each of the plurality of second focus

points, wherein the objective lens height at points in the second focal surface other than said plurality of second focus points is estimated and the second focal surface is non-planar; scanning an image of the second linear strip, wherein the height of the objective lens relative to the microscope slide follows the predetermined second focal surface; and composing the image of the first linear strip and the image of the second linear strip into a contiguous image of the specimen (Soenksen page 54 lines 26-28).

Regarding **claim 15**, Soenksen as further viewed (refer to the rejection of claim 7) discloses (refer to the rejection of claim 7) the method of claim 14, wherein determining a plurality of focus points on a linear strip comprises: moving the stage in a direction orthogonal to the objective lens; continuously adjusting the height of the objective lens relative to the stage along a predetermined path while the stage is in motion; scanning image data of the linear strip while the stage is in motion and the height of the objective lens is continuously adjusted; and determining a plurality of objective lens heights having the greatest contrast in the scanned image.

7. **Claim 17** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Soenksen (WO 2001/084209 A2) in view of

ii. Montagu (US 6,262,838 B1)

iii. Cottingham (US 4,806,015)

as applied to claim 14 above, and further in view of

iv. Raz (CA 2,229,175 A1).

Regarding **claim 17**,Soenksen as further viewed (refer to the rejection of claim 2, similar reasoning is used here) the method of claim 14, wherein creating a focal surface comprises: connecting a focus point with a pair of neighboring focus points to define a triangular region; and combining a plurality of triangular regions into a non-planar focal surface.

8. **Claim 18** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Soenksen (WO 2001/084209 A2) in view of

ii. Montagu (US 6,262,838 B1)

iii. Cottingham (US 4,806,015)

iv. Raz (CA 2,229,175 A1)

as applied to claim 17 above, and further in view of

v. Skoll (US 6,763,140 B1)

Regarding **claim 18**, Soenksen as viewed does not expressly disclose the method of claim 17 wherein the plurality of focus points includes at least four focus points.

Skoll discloses a microscope pre-scan triangular focusing system comprising at least three focus points for forming a triangular region to further form a mesh surface being a combination of adjacent triangular regions (fig. 16, col. 10 lines 29-36, Claim 12 – one of ordinary skill would obviously know that 3 adjacent triangular regions sharing points may be made from at least 4 points). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to require when forming

triangular regions as taught by Soenksen as viewed at least 4 focus points as taught by Skoll in order to form a focusing mesh comprised of adjacent triangles (col. 3 lines 51-61).

Allowable Subject Matter

9. **Claim 16** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Worster (US 6,288,792 B1) teaches pre-scan of focus z using contrast method.

Wetzel (US 7,155,049 B2) teaches a plurality of focus points.

Watanabe (JP 2001/210263 A) teaches a focus map for each strip.

Wada (JP 2002/042706 A) teaches a focus position map.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL SAUNDERS whose telephone number is (571)270-3319. The examiner can normally be reached on Mon-Thur 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on 571.272.7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PS/
7/14/2008

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